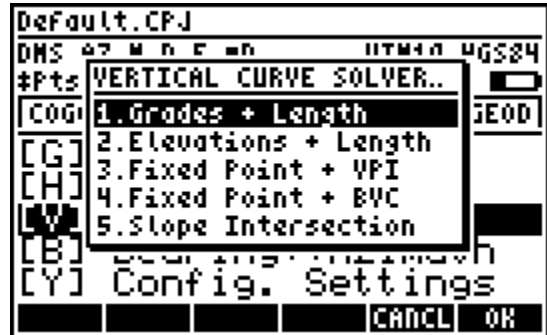


Vertical Curve Solver

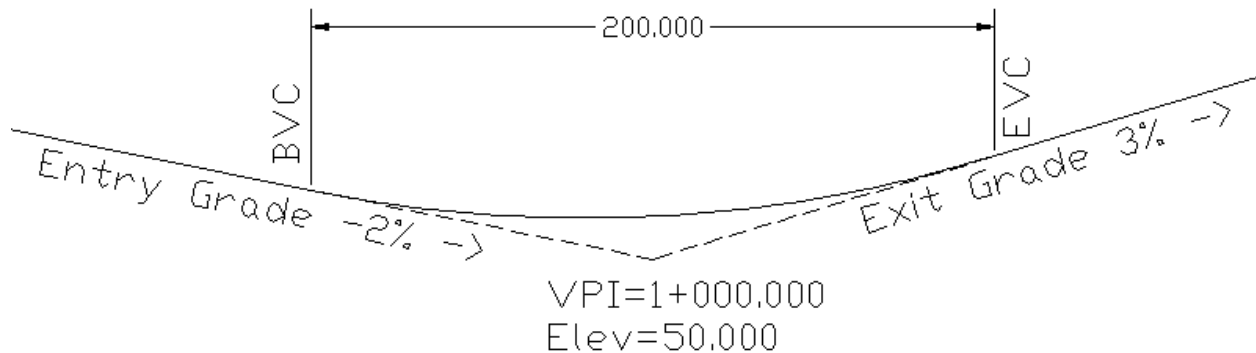
Using COGO+ Pro by [Simple Geospatial Solutions](#)

The Vertical Curve Solver program in COGO+ Pro is found in the TOOLS menu. The solver can be used with 5 possible solving scenarios, depending on the type of information known. When the curve is solved it is also possible to calculate elevations for any station on the curve, as well as on tangents outside the curve.

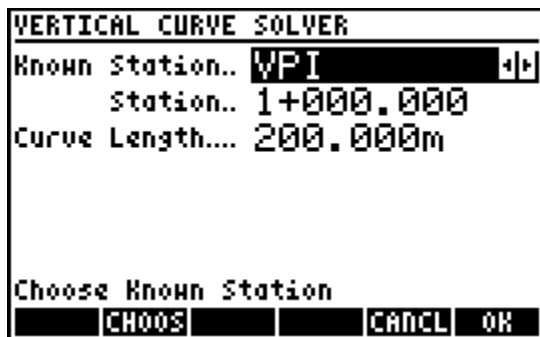


Example 1

A vertical curve is given with a length of 200m and a known station at the VPI of 1+000 and a known elevation of 50.000, also at the VPI. The entry grade is -2%, exit grade is 3%. Solve the stations and elevations of the BVC and EVC.



Step 1: Start the Vertical Curve Solver and choose "1.Grades + Length", then enter the known station and length information.



Step 2: Next enter the grade and elevation information.

```
VERTICAL CURVE SOLVER
Entry Grade.. -2.000 %
Exit Grade... 3.000 %
Known Elev... VPI
              Elev... 50.000m
Entry Grade
EDIT  CANCL  OK
```

Step 3: The curve solution is displayed, with stations and elevations solved at BVC, VPI, EVC and the High/Low point. Note the softmenu.

```
VERTICAL CURVE SOLUTION
BVC Sta... 0+900.000
  Elev.. 52.000m
VPI Sta... 1+000.000
  Elev.. 50.000m
EVC Sta... 1+100.000
  Elev.. 53.000m
LOW Sta... 0+980.000
  Elev.. 51.200m
Elev? Sta? INT EXPRT  OK
```

Option 1: Press [Elev?] to solve the elevation at any station.

```
SOLVE ELEVATION
Station..... 1+019.500
.....
Elevation.. 51.395m
Enter Station to Solve
EDIT  CANCL
```

Option 2: Press **F2** [**Sta?**] to solve the station with a certain elevation.

```

SOLVE STATION(S)
Elevation.. 51.500m
-----
Station 1.. 0+931.010
Station 2.. 1+028.990

Enter Elevation to Solve
EDIT  OK  CANCEL
    
```

Option 3: Press **F3** [**INT**] to enter a station interval and solve the elevations at each station.

```

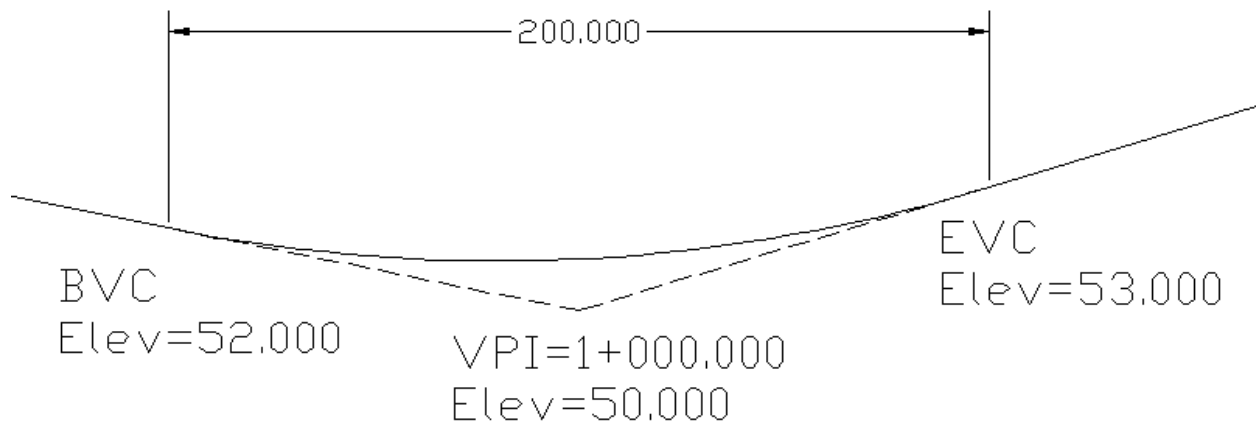
VERTICAL CURVE
-----
Station Interval:
10+
-----
CANCEL  OK
    
```

```

Station Interval Elevations
BVC: 52.000
0+910.000: 51.813
0+920.000: 51.650
0+930.000: 51.513
0+940.000: 51.400
0+950.000: 51.313
0+960.000: 51.250
0+970.000: 51.213
0+980.000: 51.200
0+990.000: 51.213
GRAPH  OK
    
```

Example 2

A vertical curve is given with a length of 200m and a known station at the VPI of 1+000 and known elevations at BVC of 52.000, at VPI of 50.000 and at EVC of 53.000. Solve the entry and exit grades.



Step 1: Start the Vertical Curve Solver and choose "2.Elevations + Length", then enter the known station and length information.

```
VERTICAL CURVE SOLVER
Known Station.. VPI
                Station.. 1+000.000
Curve Length... 200.000m

Choose Known Station
CHOOS          CANCL  OK
```

Step 2: Enter the known elevation values.

```
VERTICAL CURVE SOLVER
BVC Elevation.. 52.000m
VPI Elevation.. 50.000m
EVC Elevation.. 53.000m

Enter BVC Elevation
EDIT          CANCL  OK
```

Step 3: The curve solution is displayed, with values solved for the entry and exit grades, the stations at the BVC, VPI, EVC and High/Low point, and the elevation at the High/Low point. Again note the softmenu, the same options are available as shown in Example 1.

```
VERTICAL CURVE SOLUTION
.....
Entry Gd.. -2.000 %
Exit Gd... 3.000 %
BVC Sta.. 0+900.000
VPI Sta... 1+000.000
EVC Sta... 1+100.000
LOW Sta... 0+980.000
            Elev.. 51.200m

Elev? Sta? INT EXPRT  OK
```